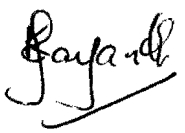
Factors influencing infant feeding decisions among participants enrolled in the Special Supplemental Program for Women, Infants, and Children (WIC)

An Honors Thesis (HONRS 499)

By

Teresa K. Weiss

Dr. Jayanthi Kandiah



Ball State University

Muncie, Indiana

July 2007

Date of Graduation: July 21, 2007

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THESIS ABSTRACT

Thesis: Factors influencing infant feeding decisions among participants enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

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The objectives of this research were to determine i) mothers' attitudes toward breastfeeding ii) situational factors that influence infant feeding decisions and iii) identify problems associated with low initiation and continuation rates of breastfeeding among WIC mothers. A sample of 314 participants at the Madison County WIC program in Anderson, Indiana completed a 17 itemized questionnaire entitled Breastfeeding Survey, which took approximately 20 minutes to complete. The Breastfeeding Survey included questions addressing demographics, previous infant feeding decisions, and attitudes toward breastfeeding. Data was analyzed statistically using logistic regressions. Significance was set at $p < .05$. In addition, percentages and frequencies were calculated. More than two-thirds of participants were white/Caucasians (279; 88.9%). Examination of the educational level of the mothers showed that 33.4% (n=105) had a high school diploma/GED, 29.6% (n=93) had some high school education, and 24.2% (n= 76) had some college education. Results revealed that the majority of participants obtained information about breastfeeding from WIC (53.4%; n=167). The other to three sources from whom they obtained breastfeeding were family (49.8%; n=156), Health care providers (47.0%; n=147), and friends (33.2%; n=104). Mothers' attitudes toward breastfeeding showed that women who agreed with the statement "Breastfeeding is easier than formula feeding" were more likely to

initiate breastfeeding. Mothers who breastfed were 54% more likely to disagree with the statement "Formula is just as good for my baby as breast milk". Also, women who disagreed with the statement "Supplementing formula while breastfeeding is a good way to make sure my baby is getting enough to eat" were 38% more likely to successfully breastfeed ($p = .039$). The primary situational factors that influenced infant feeding decisions were education, partner support, timing of infant feeding decision, and knowledge about the benefits of breastfeeding. These situational factors were also the major problems that affected initiation and continuation rates of breastfeeding among WIC mothers. In conclusion, this study found that women with some college education were five times more likely to initiate breastfeeding than those who only had a high school education. Mothers who initiated breastfeeding were more likely to perceive themselves as knowledgeable about the benefits of breastfeeding. They were also more likely to think that breast milk is nutritionally superior to formula and that breastfeeding was easier than formula feeding. In addition, women who rated their partners as supportive of breastfeeding were more likely to initiate breastfeeding.

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INTRODUCTION

Breast milk is the ideal food for infants, as stated by the United States Department of Health and Human Services in their "Blueprint for Action." (1). It is easily absorbed, has a low solute load, an increased availability of vitamins, minerals, and proteins, as well as various anti-infectious factors and immune cells. The American Academy of Pediatrics, the American Dietetic Association and the World Health Organization all recommend breastfeeding infants for the first year of life (2) In 2001, the American Dietetic Association stated in their position paper that "A dose-response relationship exists where the more breast milk an infant receives in the first six months of life, the less likely the infant is to develop health problems" Benefits such as improved cognition, improved immune system development, good dental development, reduced risk of respiratory infections, gastrointestinal illnesses, childhood leukemia, and obesity have been associated with breastfeeding (3, 12). According to the United Nations International Children's Educational Fund (UNICEF), if every baby was exclusively breastfed approximately 1.3 million children's lives could be saved each year (4). Besides health benefits, breastfeeding costs less and promotes bonding between mother and child (12).

Despite the many recommendations by health experts and the vast amount of medical evidence supporting breastfeeding, the breastfeeding rate in the U.S. is still quite low at 59%. Rates for participants of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) lag behind even further. The WIC program is for pregnant and postpartum women, infants, and children under five years of age. Participants must meet income guidelines that are set at 185% of the federal poverty level and must be determined by a health professional to be at nutritional risk. The rate of initiation of breastfeeding among WIC mothers lags behind that of non-WIC mothers by about 23%. At six months of age, the gap has increased from 16% to over 20% in the last 30 years (5). In order to help the WIC population succeed in breastfeeding, WIC nutritionists need to understand the factors that influence a mother's decision to initiate and continue breastfeeding. If these factors are understood, WIC nutritionists can more effectively

help women overcome their personal barriers that stand in the way of giving their child the best nutrition possible. Thus, the objectives of this research were to determine i)mothers' attitudes toward breastfeeding ii) situational factors that influence infant feeding decisions and iii) identify problems associated with low initiation and continuation rates of breastfeeding among WIC mothers.

REVIEW OF LITERATURE

Informational sources relating to breastfeeding

WIC strives to educate women on the benefits of breastfeeding and about breastfeeding techniques, but it is likely that most women receive information on breastfeeding outside the WIC program. McFadden and Toole looked at a focus group of 35 women in the UK to explore women's views of breastfeeding. They found that many women with friends who had difficulties breastfeeding were more likely to not try breastfeeding themselves. They also found that most women gained knowledge about breastfeeding from books, leaflets and prenatal classes, while knowledge of bottle-feeding was experiential. Most of the participants seemed be cognizant of the fact that breastfeeding is best for the baby's health, but could not cite specific benefits (8). Arora et. al surveyed 245 women to determine factors influencing breastfeeding rates in a family medicine practice in Pennsylvania. Responses indicated that breastfeeding information was obtained from the media and from family members.

Smith et. al., conducted a study with 19 women who took either a childbirth class or both a childbirth and a lactation class at the University of Utah Perinatal Patient Education Department. After completion of the respective classes, women were surveyed to determine initiation and continuation rates. Of those mothers surveyed, 100% initiated breastfeeding. At the time of the survey, 88% of the mothers who had taken the lactation class in addition to the childbirth class were still breastfeeding compared to only 36% of the mothers who took only the childbirth class. Mothers were also asked to rate their breastfeeding experience on a scale of 1 to 5, with 1 being poor and 5 being excellent. Mothers who took

the lactation class had an average score of 4.25, while those who did not had an average score of 2.8; indicating lactation classes enhanced breastfeeding duration (13).

Factors influencing infant feeding decisions

To investigate factors influencing mothers' breastfeeding decisions, researchers surveyed 245 mothers from a family medicine practice in northwestern Pennsylvania. Results revealed for the majority of the participants, the most significant factors that influenced mothers' reluctance to breastfeed were father's attitudes, her need to return to work, and her inability to assess milk supply (7). In the mothers who breastfed (n=130), the most important factors that influenced their decision to initiate breastfeeding were the infant's health, naturalness, and emotional bonding. The bottle-feeding participants (n=115) indicated that they would be more likely to breastfeed had they received support from the infant's grandmother or other family members. Approximately 78% of all mothers indicated that they had made their decisions regarding infant feeding before the pregnancy or in the first trimester.

Shepherd et al., interviewed 256 mothers within 4 days of giving birth to assess determinants of feeding decisions. They found that mothers who breastfed were more likely to be married or living with their partners, smoked less, owned their own homes, decided on an infant feeding method before conception, were of a higher social class, were older, and had longer duration of higher education (14).

Another study, done by Mitra et al., at 18 county health departments in Mississippi, surveyed pregnant women to determine their intentions regarding infant feeding. They found that women who intended to breastfeed were more often white, better educated, and had higher income, smaller household size, and breastfeeding experience. Other significant factors that were more modifiable included breastfeeding knowledge, self-efficacy, and perceptions of social support for breastfeeding (11).

Attitudes toward breastfeeding

Researchers have compared perception and knowledge of mothers who breastfed or bottle-fed their infants. Shaker et al., found that parents of breastfed infants had more positive attitudes

towards breastfeeding than parents of formula-fed infants. In addition, parents of breastfed infants were more knowledgeable about the nutrition and health benefits of breast milk (6). Unlike parents of breastfed infants, parents of formula-fed infants had some misconceptions about breastfeeding, such as the belief that mothers who drink alcohol occasionally should not breastfeed.

McFadden et al., gathered information regarding women's views of breastfeeding using focus groups (n=35). Results from the focus group showed that most women were embarrassed to breastfeed in public and felt breastfeeding restrained their day-to-day activities (8). There was a general perception in the focus groups that breastfeeding is difficult and painful.

HYPOTHESES

H1: Women who have higher education and knowledge that breast milk is nutritionally superior to formula will be more likely to initiate breastfeeding.

H2: Women who have more positive attitudes toward breastfeeding will be more likely to initiate breastfeeding.

H3: Women who initiate breastfeeding will

a. have begun having children at a more advanced age.

b. have been breastfed as a child.

H4: Women who successfully breastfeed will display certain characteristics that will be absent in those who do not:

a. They will have made the decision to breastfeed early in the pregnancy.

b. They will have partners and family members that are supportive of breastfeeding and influence their decision to breastfeed.

c. They will disagree with formula supplementation while breastfeeding.

d. They will disagree that breastfeeding is painful.

METHOD

Participants and Procedures

A sample of 314 participants at the Madison County WIC program in Anderson, Indiana completed a 17 itemized questionnaire entitled Breastfeeding Survey (Appendix A), which took approximately 20 minutes to complete. The survey was validated by giving it to five dietitians at the Madison County WIC clinic who examined it for content and face validity. After the breastfeeding survey was validated, it was administered to participants who attended the Madison County WIC clinic. Participants were encouraged to complete the survey when they attended the clinic for regularly scheduled certification or nutrition appointments. Prior to participants; completion of the survey, all subjects were informed of the purpose of the research and were given the option to choose not to complete it without jeopardizing their eligibility and benefits associated with the WIC program. To ensure confidentiality, all surveys were collected by WIC employees, so the identities of the participants were kept anonymous to the researcher. Duration of the research was for a period of four months, January to April 2007.

All completed surveys were collected for the researcher by the dietitians, nurses, or clerks at the WIC clinic. The data was compiled and sent to statistician Dr. James Jones of University Computing Services. Prior to administration of the research, the study was approved by the Institutional Review Board at Ball State University (Appendix B)

Measures

The Breastfeeding Survey included questions addressing demographics, previous infant feeding decisions, and attitudes toward breastfeeding. Question 1-6 looked at demographic information such as age, ethnicity, education, number of children, and if participant was breastfed by her mother longer than

four months. Question 7 looked at sources from who mother gained information about breastfeeding. Questions 8-16 looked at factors that influenced mothers' infant feeding decision. Question 17 measured attitudes using a Likert scale in which participants rated their agreement to statements regarding breastfeeding on a scale of 1 to 5 (1 =strongly agree, 5= strongly disagree).

Statistical Analysis

Data was analyzed statistically using logistic regressions. Significance was set at $p < .05$. In addition, percentages and frequencies were calculated.

RESULTS

Demographics

As observed in Table 1, from a pool of 314 WIC mothers, the majority of the participants (n= 143; 45.5%) were between 18- 24 years of age. More than two-thirds of participants were white/Caucasians (279; 88.9%). When examining the educational level of the mothers, it was found that 33.4% (n=105) had a high school diploma/GED, 29.6% (n=93) had some high school education, and 24.2% (n= 76) had some college education. In this population, most mothers had either one or two children (n=109; 34.7%). More than 50% of the mothers indicated that their first child was born when they were between 18-24 years of age (n=193; 61.5%). As would be expected, 66.6% (n=209) were not breastfed as a child for more than four months. Complete demographic information for the 314 respondents can be found in Table 1.

Table 1: Demographic information about WIC mothers

Factor	Number	Percent
Age		
1. 17 or under	19	6.1
2. 18-24	143	45.5
3. 25-34	127	40.4
4. 35 or over	22	7.0
missing	3	1.0
Ethnicity		
1. White/Caucasian	279	88.9
2. Black/African-American	22	7.0
3. Hispanic	2	.6
4. Other	8	2.5
missing	3	1.0
Education		
1. Some high school	93	29.6
2. high school diploma/GED	105	33.4
3. Some college	76	24.2
4. Two year degree	18	5.7
5. Four year degree	15	4.8
6. Graduate/Advanced degree	3	1.0
missing	4	1.3
Number of Children		
0. Pregnant with 1st child	12	3.8
1. 1	109	34.7
2. 2	109	34.7
3. 3	47	15.0
4. 4 or more	31	9.9
missing	6	1.9
Age at which first child was born		
1. 17 or under	65	20.7
2. 18-24	193	61.5
3. 25-34	32	10.2
4. 35 or over	3	1.0
missing	21	6.7
Breastfed as a child for longer than 4 months?		
1. yes	49	15.6
2. no	209	66.6
3. I don't know	34	10.8
missing	22	7.0

Breastfeeding Knowledge

Participants were asked to identify nutrition information sources from which they gathered knowledge regarding breastfeeding. They were asked to identify all sources. Results revealed that the majority of participants obtained information about breastfeeding from WIC (53.4%; n=167). The other to three sources from whom they obtained breastfeeding were family (49.8%; n=156), Health care providers (47.0%; n=147), and friends (33.2%; n=104). Only 13.8% (n=43), had gained breastfeeding knowledge from school, and 15.5% (n=48) had ever learned anything about breastfeeding from television.

Initiation of Breastfeeding

Of the 300 participants who responded to question 8, "Have you ever breastfed?", 54.3% (n= 163) indicated that they had. Of the 163 that initiated breastfeeding, 47.8% (n=78) said they had made the decision to breastfeed before becoming pregnant (question 9). In 33.2% of the cases (n= 54), no one influenced the mothers' decision to breastfeed, while 19.5% (n= 32) said their parents were most influential. Partners were most influential in 12.2% (n= 20) of cases, other family members in 11.2% (n= 18) of cases, and WIC staff in 10.7% (n= 17) of cases (question 10). When mothers were asked how long they breastfed, the majority stated that they breastfed one month- six months (32.3%; n= 53). Approximately one-fourth of the women indicated that they breastfeed for less than two weeks (27.2%; 44), but 24.4% (n= 40) of the mothers indicated they breastfeed from six months- longer than one year. Only 15.2% (n= 25) had breastfed for two weeks- one month (question 11). The main reason for discontinuation of breastfeeding was not having enough milk (28.1%; n= 46), followed by going back to work or school (18.3%; n= 30). About 32.7% cited other reasons (n= 53), most often that they had difficulty getting the baby to latch (question 12).

Questions 13-16 pertain to women who had not ever breastfed. Of the 137 who have not ever breastfed, 48.0% (n= 66) made the decision not to breastfeed before becoming pregnant. In 44.0% of cases (n= 60), the mother decided not to breastfeed because they planned to go back to work or school,

and 11.9% (n= 16) did not want to breastfeed because they heard it was painful or difficult. About 35.1% (n= 57) cited other reasons for not wanting to breastfeed, such as medical reasons, the perception that they were too old, lack of success with previous children, or lack of desire. Many women stated that they tried unsuccessfully to breastfeed initially, so resorted to bottle-feeding. The majority, 86.3% (n= 118), stated that no one influenced their decision not to breastfeed. When asked what would encourage them to try breastfeeding, 30.0% (n= 41) said talking with women who successfully breastfed, 22.2% (n= 30) said more comfortable places to breastfeed in public, 17.8% (n= 24) said more information from prenatal health care providers, and 13.3% (n= 18) each said information from the media or more support from family and friends. The remaining 3.3% (n=5) said that nothing would encourage them to breastfeed.

As observed in Table 2, using binary logistic regression, several variables were tested to determine if they significantly impact the decision whether or not to initiate breastfeeding. The model as a whole was statistically significant ($\chi^2 = 102.51$, df = 16, $p < .001$), with the correct classification of subjects rising from 58.7% in the base model to 78.5%, and the Nagelkerke R square = .497. Education levels were found to be significant overall (Wald = 10.31, df = 4, $p = .035$). If the mother has at least some college education, she is five times more likely to initiate breastfeeding compared to mothers whose education level is only some high school.

Perceived knowledge about the benefits of breastfeeding was positively related to initiating breastfeeding, as was agreement with the statement "Breastfeeding is easier than formula feeding". Support of the mother's partner was also significantly associated with breastfeeding ($p = .017$), as those who rate their partners as supportive are 48% more likely to breastfeed. Mothers who breastfed were 54% more likely to disagree with the statement "Formula is just as good for my baby as breast milk".

Factors that were not found significant in the decision to breastfeed include ethnicity, age at which first child was born, being breastfed as a child, perceived family support, and feeling that breastfeeding is embarrassing in public or in the home.

Table 2: Predictors of initiation of breastfeeding

							95.0% C.I. for Exp(B)	
Variables	B	SE	Wald	df	Sig.	Exp(B)	Lower	Upper
Ethnicity	.320	.565	.321	1	.571	1.377	.455	4.166
Education			10.313	4	.035			
Education (some high school)	.646	.455	2.017	1	NS	1.907	.782	4.650
Education (high school diploma/GED)	1.616	.526	9.420	1	.002	5.031	1.793	14.118
Education (some college)	1.187	.868	1.870	1	NS	3.278	.598	17.972
Education (4 year degree)	1.396	.962	2.109	1	NS	4.041	.614	26.603
Age at which first child was born			.560	2	NS			
Age at which first child was born (17 or under)	-.235	.452	.270	1	NS	.791	.326	1.917
Age at which first child was born (18-24)	-.517	.709	.532	1	NS	.596	.148	2.394
Breastfed as a child	.516	.517	.995	1	NS	1.676	.608	4.619
Perceived knowledge about benefits of breastfeeding	-1.109	.350	10.024	1	.002	.330	.166	.655
Belief breast milk is nutritionally superior	.44	.175	6.431	1	.011	1.558	1.106	2.196
Belief breastfeeding is easier than bottle-feeding	-.340	.162	4.384	1	.036	.712	.518	.979
Confidence in ability to support family by buying infant formula	.178	.169	1.109	1	NS	1.194	.858	1.662
Family supports breastfeeding	.177	.297	.354	1	NS	1.193	.667	2.133
Partner supports breastfeeding	-.664	.280	5.650	1	.017	.515	.298	.890
Embarrassed to breastfeed in public	-.062	.158	.157	1	NS	.939	.690	1.280
Embarrassed to breastfeed at home	.178	.199	.805	1	NS	1.195	.810	1.764
Constant	.802	1.066	.567	1	NS	2.231		

Successful Breastfeeding

For the purpose of this study, successful breastfeeding is defined as breastfeeding for at least one month. Although this time period is much shorter than recommended, many researchers measure one month postpartum as the one of the first markers of successful continuation of breastfeeding (9, 10). According to this standard, 25.5% of respondents were considered successful. Using binary logistic regression, successful and unsuccessful breastfeeding mothers were compared. The results are shown in Table 3. The model as a whole was statistically significant (χ^2= 60.98, df = 21, $p < .001$), with the correct classification of subjects rising from 57.6% in the base model to 74.8%, and the Nagelkerke R square =

.477. Making the decision to breastfeed after the first trimester was significantly associated with successful breastfeeding ($p = .038$). Also, women who disagreed with the statement "Supplementing formula while breastfeeding is a good way to make sure my baby is getting enough to eat" were 38% more likely to successfully breastfeed ($p = .039$).

Factors not significantly associated with successful breastfeeding include disagreement with the idea that breastfeeding is painful, believing formula is inferior to breast milk, and disagreeing that most women have a problem producing enough milk. Making a decision about breastfeeding early in pregnancy was not statistically significant. Having supportive partners was statistically significant ($p= .017$) in the decision to breastfeed, whereas having supportive family members was not, indicating that family members did not play a major role in being supportive and influential in mothers' decision to breastfeed. Women who successfully breastfed did not have higher levels of education.

Table 3: Predictors of successful breastfeeding

							95.0% C.I. for Exp(B)	
	B	S.E.	Wald	Df	Sig.	Exp(B)	Lower	Upper
Timing of decision to breastfeed			4.444	3	NS			
Timing of decision (before pregnancy)	1.115	.751	2.206	1	NS	3.050	.700	13.284
Timing of decision (1st trimester)	.709	.776	.836	1	NS	2.033	.444	9.294
Timing of decision (after 1st trimester)	1.664	.801	4.316	1	.038	5.278	1.099	25.252
Parents most influential in decision to breastfeed	.634	.704	.813	1	NS	1.886	.475	7.488
Other family members most influential	-1.169	.844	1.918	1	NS	.311	.059	1.625
Partner most influential	.441	.835	.280	1	NS	1.555	.303	7.982
Friends most influential	-.033	1.118	.001	1	NS	.968	.108	8.653
Doctor/midwife most influential	.338	.755	.201	1	NS	1.403	.319	6.162
WIC staff most influential	.703	.770	.834	1	NS	2.021	.447	9.143
Made decision alone	-.432	.716	.364	1	NS	.649	.160	2.642
Stopped breastfeeding because length of time was sufficient	19.93.7167	8293.072	.000	1	NS	455344327.913	.000	
Stopped breastfeeding due to pain	-.238	.980	.059	1	NS	.788	.116	5.377
Stopped breastfeeding because of work/school	.821	1.171	.491	1	NS	2.272	.229	22.528
Did not have enough milk	-.973	.999	.949	1	NS	.378	.053	2.677
Felt too tied down	.609	1.600	.145	1	NS	1.839	.080	42.340
Stopped breastfeeding for other reasons	-1.308	1.048	1.558	1	NS	.270	.035	2.108
Belief that breastfeeding is painful	.079	.209	.142	1	NS	1.082	.718	1.630
Belief that formula is nutritionally equivalent to breast milk	.187	.230	.659	1	NS	1.205	.768	1.892
Belief in supplementing with formula	.483	.234	4.251	1	.039	1.621	1.024	2.567
Belief that most women can't make enough milk	-.309	.280	1.223	1	NS	.734	.424	1.270
Perceived ability to afford formula	.339	.218	2.406	1	NS	1.403	.915	2.152
Constant	-2.445	1.552	2.480	1	NS	.087		

Hypothesis 1 stated women who have higher education and knowledge that breast milk is nutritionally superior to formula will be more likely to initiate breastfeeding; results revealed that this was true. As evidenced in Table 2, women with higher education levels and higher perceived knowledge of the benefits of breastfeeding were more likely to breastfeed (p = .002). Hypothesis 2 predicted that women who have positive negative attitudes toward breastfeeding will be less likely to successfully breastfeed. This was found in that women who believe breastfeeding is easier than bottle-feeding (p= .036) and those who believe breast milk is nutritionally superior to formula (p= .011) were more likely to initiate breastfeeding. Hypothesis 3 stated that women who had children at a later age and were breastfed as a child would be more likely to breastfeed. These factors were found to be non-significant.

For women who successfully breastfeed, hypothesis 4 predicted that they will have certain characteristics that are present in women who do not successfully breastfeed. Partner support was found significant while support of family member was not. Disagreeing that breastfeeding is painful is not significantly linked, but disagreeing with formula supplementation is linked to successful breastfeeding. Hypothesis 4 predicted that women who successfully breastfeed will have made the decision early in pregnancy, but the results indicated that these women had made the decision after the first trimester.

DISCUSSION

The results of this study confirmed findings from McFadden and Toole's in that many women (33.2%) gained breastfeeding knowledge from friends and books (31.1%). Arora et al., found that most women learn about breastfeeding from family, which these results confirm (49.8%) However, in the study by Arora et al., the other top sources of breastfeeding information were the media, which was not congruent with the present research, as only 15.5% stated that they gained breastfeeding knowledge from TV, and 6.0% from the internet. The media could potentially be a powerful resource to reach women from every socioeconomic status with valuable information on breastfeeding.

These results indicate that the father's support is linked to mother's decision to initiate breastfeeding, which also agrees with the results of Arora et al. Shepherd et al., and Mitra et al., found that mothers who breastfed were more likely to have higher education. Their finding were similar to the present research, which found that women who have some college compared to just a high school education were more likely to breastfeed. Shepherd's study found that women who breastfed were more likely to have made the decision before conception. Interestingly, this study produced a much different result. Women who successfully breastfed were more likely to have made the decision after the first trimester. A possible reason for this discrepancy could be that Shepherd's study surveyed women of all socioeconomic statuses, while this study surveyed low-income women, a population in which pregnancies are often unplanned.

The findings of Mitra et al., and Shaker et al., showed that women with higher breastfeeding knowledge and self-efficacy were more likely to breastfeed for longer duration. Similar observations were also noted in this research in that women who initiated breastfeeding rated themselves as more knowledgeable and agreed that breastfeeding is easier than formula feeding. A unique finding of this study showed that women who successfully breastfed were more likely to disagree with the idea that supplementing formula while breastfeeding is a good way to ensure the baby is getting enough to eat. This could possibly indicate that supplementing formula interferes with successful breastfeeding, or that women who are most determined to exclusively breastfeed are more successful.

LIMITATIONS

The sample selection was limited to Madison County WIC participants that attended the clinic between January 2007 and April 2007, and the assumption was made that this sample was representative of the WIC population. It was also assumed that subjects were literate and were honest in their responses to the survey. All ethnic groups were not equally represented, as results indicated that an overwhelming majority (88.9%; n=279) of the participants were white Caucasians.

STRENGTHS

This research was unique in that it focused solely on WIC participants. Much research has been done on breastfeeding in the general population and in low-income populations, but not much has targeted WIC mothers. This study not only looked at initiation of breastfeeding, but compares mothers who have successfully breastfed for at least a month and those who breastfed less than one month. In addition, this study looked at a multitude of situational factors and attitudes about infant feedings that could influence a mother's decision to either breastfeed or bottle-feed.

CONCLUSIONS AND RECOMMENDATIONS

This study found that women with some college education were five times more likely to initiate breastfeeding than those who only had a high school education. Mothers who initiated breastfeeding were more likely to perceive themselves as knowledgeable about the benefits of breastfeeding. They were also more likely to think that breast milk is nutritionally superior to formula and that breastfeeding was easier than formula feeding. In addition, women who rated their partners as supportive of breastfeeding were more likely to initiate breastfeeding.

Women who continued to breastfeed after one month postpartum (defined as successful breastfeeding) were more likely to have made the decision to breastfeed after the first trimester. Women who successfully breastfeed were less likely to think that supplementing with formula while breastfeeding was a good idea.

This research could have several benefits toward WIC participants because of their low socioeconomic status and nutritional risk. Findings from this research will possibly motivate mothers to breastfeed for longer duration and could stimulate more positive attitude towards breastfeeding. In addition, breastfeeding is more economical than formula and it will bring an emotional bond between mother and child. Results of this study will be helpful to WIC employees and other health professionals in

that educational strategies could be developed to help parents overcome barriers that hinder successful breastfeeding.

For future studies, it would be beneficial to survey a greater variety of ethnicities. Also, recruiting a larger sample size of women who have successfully breastfed longer than one month may help in finding more significant factors that differ between that group and those who breastfeed for less than one month. Collecting data for a longer period of time and in multiple WIC clinics could help accomplish those goals. Finally, it would be beneficial to collect data on breastfeeding attitudes and experiences of WIC mothers and non-WIC mothers to explore the differences between these two groups that account for the differences in breastfeeding rates.

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APPENDICES

Breastfeeding Survey

Please circle your answer.

1) What is your age?
   a) 17 or under
   b) 18- 24
   c) 25-34
   d) 35 or over

2) What is your ethnicity?
   a) White/Caucasian
   b) Black/ African- American
   c) Hispanic
   d) Asian/Pacific Islander
   e) Other, please specify: _____

3) What is the highest level of schooling you have completed?
   a) Some high school
   b) High school diploma/GED
   c) Some college
   d) Two year degree
   e) Four year degree
   f) Graduate/Advanced degree

4) How many children do you have?
   a) Pregnant with my first child (**Thank you for participating. You don't need to complete the rest of the survey**)
   b) 1
   c) 2
   d) 3
   e) 4 or more

5) How old were you when you had your first child?
   a) 17 or under
   b) 18-24
   c) 25-34
   d) 35 or over

6) As a child, were you breastfed by your mother for longer than 4 months?
   a) Yes
   b) No
   c) I don't know

7) Where did you obtain information about breastfeeding? (**circle all that apply**)
   a) TV
   b) Videos
   c) School
   d) Books
   e) Family
   f) Friends
   g) Health care providers
   h) WIC
   i) Internet
   j) other, please specify_____

8) Have you ever breastfed?
   a) Yes
   b) No. (**if no, please go to question #13**)

9) When did you decide to breastfeed?
   a) Before becoming pregnant
   b) In the first trimester
   c) After the first trimester
   d) After delivery of my baby

10) Who was the most influential person in your decision to breastfeed?
   a) Parents
   b) Other family members
   c) Partner
   d) Friends
   e) Co-workers
   f) Doctor/midwife
   g) WIC staff
   h) None; I decided on my own

11) How long did you breastfeed? (if you have multiple children, answer based on most recent child)
   a) less than 2 weeks
   b) 2 weeks- 1 month
   c) 1 month- 6 months
   d) 6 months- 1 year
   e) longer than 1 year

12) What was the main reason you stopped breastfeeding? (**Please circle only one)**
   a) Felt the length of time was sufficient
   b) Experienced pain

c) Went back to work or school
d) Did not have enough milk
e) Felt too tied down
f) other. Please explain: _____

Please answer the following if you have not breastfed. Otherwise, go to question #17.

13) When did you decide not to breastfeed?
a) Before becoming pregnant
b) In the first trimester
c) After the first trimester
d) After delivery of my baby

14) Why did you choose not to breastfeed?
a) Heard it was painful or difficult
b) Didn't want to be tied down
c) embarrassed
d) Planned to go back to work or school
e) Other, please explain: _____

15) Who was the most influential person in your decision not to breastfeed?
a) Parents
b) Other family members
c) Partner
d) Friends
e) Coworkers
f) Doctor/midwife
g) WIC staff
h) None; I decided on my own

16) Which factors would be likely to encourage you to try to breastfeed?
a) More information from prenatal healthcare providers
b) Information from TV, books, magazines
c) More support from family and friends
d) More comfortable places to breastfeed in public
e) Talking with women who successfully breastfed

For question 17, please rate the following

Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I am knowledgeable about the benefits of breastfeeding	1	2	3	4	5
I am knowledgeable about how to breastfeed	1	2	3	4	5
I feel confident in my ability to breastfeed	1	2	3	4	5
Formula is just as good for my baby as breast milk	1	2	3	4	5
Breastfeeding even for as little as a few days has benefits	1	2	3	4	5
Breastfeeding has health benefits for mothers, too.	1	2	3	4	5
Breastfeeding mothers have to watch their diets more closely	1	2	3	4	5
Breastfeeding is easier than formula feeding	1	2	3	4	5
Breastfeeding creates a special bond between mother and child	1	2	3	4	5
Breastfeeding is painful	1	2	3	4	5
Supplementing formula while breastfeeding is a good way to make sure my baby is getting enough to eat	1	2	3	4	5
Most women have problems producing enough milk	1	2	3	4	5
I would have breastfeeding support without WIC	1	2	3	4	5
I can support my family by buying infant formula	1	2	3	4	5
My family is supportive of breastfeeding	1	2	3	4	5
My partner is supportive of breastfeeding	1	2	3	4	5
My doctor/midwife is supportive of breastfeeding	1	2	3	4	5
Breastfeeding in public is embarrassing	1	2	3	4	5
Breastfeeding in my home is embarrassing	1	2	3	4	5

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INSTITUTIONAL REVIEW BOARD

TO: Teresa Weiss
Family and Consumer Sciences

FROM: Institutional Review Board
Leonard Kaminsky, Chair
Melanie L. Morris, Coordinator of Research Compliance

DATE: January 25, 2007

RE: Human Subjects Protocol – IRB # 07-166

TITLE: Factors influencing infant feeding decisions in WIC mothers

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The Institutional Review Board reviewed your protocol on January 24, 2007 and has determined the procedures you have proposed qualify as "exempt." Projects determined to be exempt on or after March 3, 2005 are no longer required to be actively monitored by the IRB. As such, there will be no further review of your protocol, and you are cleared to proceed with the procedures outlined in your protocol. As an exempt study, there is no requirement for continuing review. Your protocol will remain on file with Academic Research and Sponsored Programs as a matter of record.

Editorial notes:

1. Your study was determined to be exempt under the second exemption category, as you propose to conduct surveys/interviews/observations with adults either in an anonymous fashion or on a topic that will not reveal sensitive information about the participants that could place the participants at risk.

While your project does not require continuing review, it is the responsibility of the P.I. (and, if applicable, faculty supervisor) to inform the IRB if the procedures presented in this protocol are to be modified or if problems related to human research participants arise in connection with this project. **Any procedural modifications must be evaluated by the IRB before being implemented, as some modifications may change the review status of this project.** Please contact Melanie L. Morris in Academic Research and Sponsored Programs (mlmorris@bsu.edu; 765-285-5070) if you are unsure whether your proposed modification requires review. Proposed modifications should be addressed in writing to the IRB at Academic Research and Sponsored Programs (2100 W. Riverside Avenue). Please reference the above identification number (IRB #) in any communication to the IRB regarding this project.

Reminder: Even though your study is exempt from the relevant federal regulations of the Common Rule (45 CFR 46, subpart A), you and your research team are not exempt from ethical research practices and should therefore employ all protections for your participants and their data which are appropriate to your project.

pc: Jay Kandiah, Family and Consumer Sciences